

Synopsis of a paper on Metrics, measurements and methods: A new approach to capturing the impact of higher education

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Section I: Introduction: An overview of the issues involved in metrics development for higher education performance. References to previous literature (both academic literature and other reports.) It will include an indication of the paper's content.

Section II: a) Context for metrics: Societal perspective. This will include the UK government approach to programme evaluation and the ROAMEF policy cycle, with concepts of objectives and outcomes.

Section II: b) Context for metrics: HEI perspective. This will emphasise the different concepts and definitions of inputs, activities, outputs and outcomes. It will highlight where there is a disjuncture between (IIa) – society perspective and (II b) **HEI perspective**

Section III: Use of metrics. This will include adaptations of the FABRIC framework for performance information, performance indicators and what they mean in terms of Economy, Efficiency and Effectiveness.

Section IV: Towards the quantification of the value of HEI outputs: This will include preliminary results of work on identifying and quantifying outputs of HEIs in Scotland. This will address issues of volume, value and quality adjustment with case examples.

Section V: Conclusions. These will highlight the most important issues arising from the study of HEI outputs and discussion on where there is a real need for clarification of terms, definitions and concepts. It will indicate the extent to which HEI outputs could be quantified within the study.

Section VI: References

DRAFT Notes towards

Measures, metrics and methods: New approaches towards capturing the impact of higher education

- Over the past decade there has been a growing awareness of the role that higher education institutions play in national and regional economies. There is a substantial evidence of higher education institutions' economic impact through their activities as large businesses and their very existence in a region can be highly beneficial for that region, generating output and employment.
- However the focus has moved on to how higher education can support wider economic growth and development. There is an increasing interest in the value that may be created through the exploitation of the knowledge that higher education institutions are believed to possess. This interest stems from the belief that a country's future prosperity is tied to its ability to participate in the so-called 'knowledge economy', generating, acquiring, harnessing and exploiting knowledge for the national benefit.
- Therefore there is growing attention paid to the ways in which knowledge may flow (or 'transfer') from higher education institutions into wider society. There is also an increased pressure to show returns for public investment in higher education and that public investment in higher education can be demonstrated to deliver economic and social benefits. This has led to a desire for the development of sets of 'metrics' that can be used as performance indicators for higher education institutions, showing the extent to which they are successful in ensuring active 'knowledge transfer' through engagement with the surrounding community and businesses in the host economy.
- The existence of such metrics would enable the funder (usually Government) to both determine which activity is most valuable to the economy and society, i.e. what tends to deliver the outcomes that government wants to see achieved and to 'reward' the institutions undertaking this valuable activity. A set of metrics would assist the evaluation of interventions intended to maximize the economic benefit from public investment and enable funding agencies to target their resources on those areas of activity or programmes they feel will deliver maximum impact.
- However it has seemed remarkably difficult to develop a set of metrics to satisfy this desire. There are a number of current measures in use in the UK to distribute 'Knowledge Transfer' or 'Third Stream' funding (such as those used for the Higher Education Innovation Fund in England and the 'Knowledge Transfer Grant in Scotland.) Current measures in use are not seen as fit for purpose because they are focused on relatively narrowly quantifiable aspects of knowledge transfer e.g. patents

and licensing or income generated and they cannot capture the more 'intangible' results sought. Some of those used for HEIF are simply blunt input measures intended to reflect capacity or potential (e.g. no of academic staff) but which may even be an inappropriate input measure(e.g. for 'knowledge transfer' it is arguably certain types of *non*-academic staff who have more influence on an institution's effectiveness in facilitating knowledge transfer.)

- The data obtainable from regular surveys in existence (such as the Higher Education- Business and Community interaction survey in the UK, the Association of University Technology Managers (AUTM) in the US, UNICO and the Eurostat Community Innovation Survey) are also focused on specific of knowledge transfer activity (number of spin out companies created, number of patents gained) and are not in themselves particularly revealing as to broader impact. (While the HE-BCIS has attempted to go beyond traditional 'commercialisation' data, it has focussed more on respondent opinion rather than revealed preference and there is little reliable data to be derived from it at present .) The lack of internationally comparable measures was highlighted by Arundel and Bordoy(2006) as well as Gardner et al (2006) . A literature review of research on university-business knowledge transfer , undertaken by McLellan et al for the Economic and Social Research Council Network on HEIs in regional economies, also summarized the limitations of available metrics.
- However it is not particularly surprising that metrics development for 'knowledge transfer' or 'third stream' work is limited because there are major conceptual and definitional problems involved as well as problems of perspective.
- Firstly, there is no general consensus on the definition of 'knowledge transfer' and what activities it may encompass. In some cases it is called 'third stream', 'third mission' or 'third task', in others it is called 'technology transfer' , 'knowledge transfer' or, sometimes, 'knowledge exchange' . In terms of what it is taken to cover it is sometimes seen as mainly comprising activity relating to university links with business and industry, in the belief that this is the key route to gaining economic benefits for society. The Lambert Review of Business-University *Collaboration* (2003), for example, envisaged 'knowledge transfer ' as primarily focused on university-business interaction.

"Public spending on the teaching of students in higher education institutions amounts to over £3bn per annum and on research in universities the figure is over £2bn. Transferring the knowledge and skills between universities and business and the wider community increase the economic and social returns from this investment. This process is referred to as knowledge transfer."

Lambert review of Business-University Collaboration 2003

- However at other times 'knowledge transfer ' is thought to include all types of engagement between universities and the surrounding community, not only engagement with business and industry. However the language of knowledge transfer often continues to be couched in business terms and is focused on the achievement of 'commercial' results and often in the context of scientific inventions or products. This can cause difficulties in its applications to non-science disciplines (see Crossick 2006 in :*Knowledge Transfer without Widgets* .)
- Secondly, some believe this to be an additional aspect (hence the 'third mission') of university work, whereas others consider it to be an integral part of all university activity – a natural extension of teaching and research - and that it should not be regarded separately from the two 'main activities' of an HEI of 'teaching and research' . (e.g. Hatakenaka 2005). There is also currently little information on the totality of what HEIs do. Holdsworth and Quinn (2006) , looking at community interactions of HEIs , identified a key problem as being the lack of systematic knowledge about the activities in which HEIs actually engage.
- Thirdly, and in the view of the present authors, most crucially , there is a fundamental difficulty in relation to perspective. The 'suitable' types of metric will inevitably differ depending on the perspective and purpose of those wanting metrics.
- This latter point was recognized by Molas-Gallert et al (2002)in their report on *Measuring Third Stream Activities* . Molas-Gallert et al chose to focus on indicators of *activities* and not outcomes since they considered outcome 'impact' to involve many factors beyond universities' control. Hence, while they appreciated there was a risk that activity indicators could " encourage actors to accumulate 'countable' activities without regard to their quality or value ", they felt that metrics on outcome impact were not appropriate for funding allocation purposes. However Molas-Gallert et al did not fully consider the stage between activities and outcomes , i.e the outputs of HEIs or what they actually produce.
- The basic motivation in the UK for the development of metrics that can be applied to university knowledge transfer (or 'third mission') activities is rooted in the desire on the part of the funder (in this case government through the Funding Councils and Research Councils) to demonstrate value for money and achieve better allocative efficiency. They are essentially for resource allocation and policy evaluation purposes – a very clear example of this is the wish to develop indicators

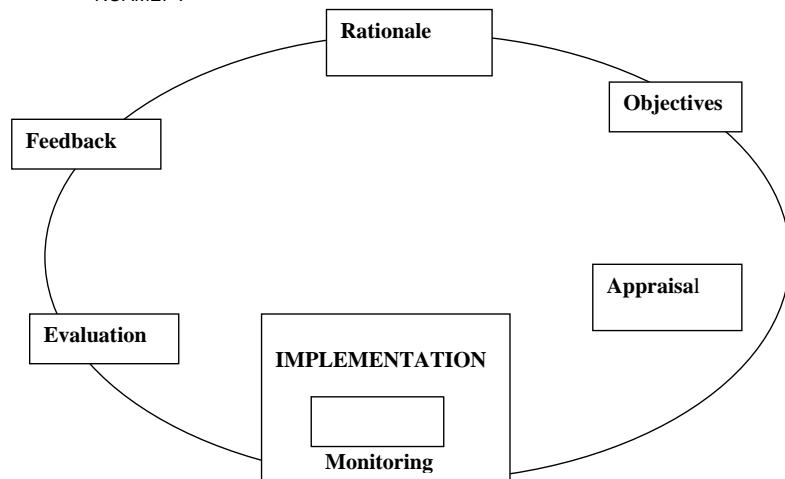
that can be used to distribute Higher Education Innovation Fund (HEIF) monies or (in Scotland) 'Knowledge Transfer Grant' monies according to the activities achieving most 'impact'. However, as preceding comments have shown, it is not entirely clear exactly what to measure or how to measure it.

- The present authors have proposed a new approach to capturing the value of HEIs which can address both the desire for metrics that could inform funding allocation and also the concern that HEIs are being assessed on factors that are beyond their control. This approach (*elaborated in a 2005 report Towards the estimate of the economic value of Scottish Higher Education Institutions*) is based on fundamental welfare economics and focusses on HEI outputs. It involves the identification of all HEI outputs, volume measurement of these outputs, and finally identification of the 'efficiency' or, market' price for these outputs (using shadow-pricing and other economic techniques where equivalent market prices cannot be identified).
- Initial case study work of a single institution resulted in the identification of over 220 separate outputs including outputs of teaching, research, cultural outreach, community outreach, consultancy and public policy advisory work.

EXAMPLES OF IDENTIFIED OUTPUTS

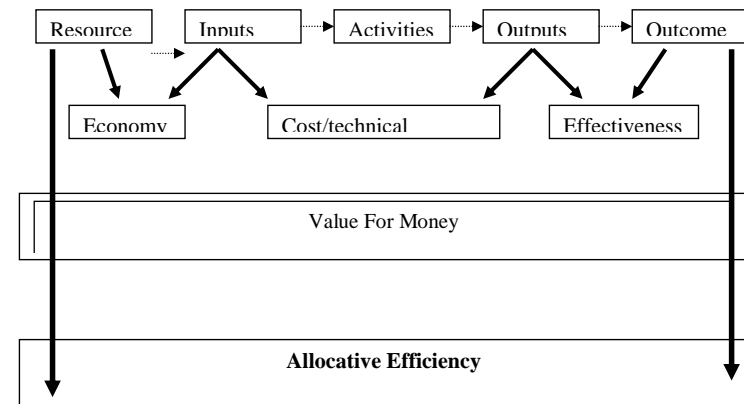
Output	Is it measurable?	Possible measures in natural units	Possible data sources	Is it priced?	Is this a Free market price?	Possible Free market price comparison
UG Business BA degree course	Yes	No. of hours teaching delivered or possibly number of FTE registered students	Registry/Department Records	Yes	No except possibly for non EU students	Use Non EU fee rate
MSC International Marketing	Yes	No. of hours teaching delivered or no. of registered students	Registry/department records	Yes	Yes	N/A
Journal articles	Yes	Number of articles	Institutional repositories, records for the Research Assessment Exercise	No	Don't know	Range of possible approaches
Magazine/ Newspaper articles	Yes	Number of articles And length of articles	Departmental records/press cuttings	Some	Some	Commercial NUJ rate
Sports Service External members	Yes	No of external members	Sports Service records	Yes	No	Cost of commercial gym membership
Legal Advice Clinic	Yes	No of advisory sessions & no of clients	Law School Records	No	No	Equivalent cost of a private legal consultation
Careers Service Graduate Support	Yes	No.of hours assistance delivered & no. of enquirers	Careers Service records	No	No	Equivalent cost of commercial careers advisory service

- The focus on HEI outputs is a relatively new concept in the UK . Indeed much of the current discussion regarding the contribution of higher education to the economy is couched in language that relates to 'desired outcomes' rather than outputs and the focus is on the development of about metrics that relate to higher education institution delivery of outcomes .
- For instance , in their consideration of the evidence for cultural engagement of UK HEIs , Doyle et al (2006) quote a UK HE sectoral body policy adviser emphasising a wish to have measurements for outcomes and dismissing measures of outputs: *'The measures of outputs, however, will not address outcomes e.g. performance art: can count bums on seats but it is more difficult to come up with measurements of the quality and even more difficult of the impact on the general community.*
- However the fundamental problem is that HEIs deliver outputs. They cannot deliver outcomes. The achievement of desired policy *outcomes* are frequently dependent on a very wide range of factors , of which the outputs delivered by an HEI may be a contributory factor , but not the only one. We would argue that the main hindrance to the development of appropriate metrics to assess UK HEI performance arises from the failure to distinguish outputs from outcomes. This can be traced to a confusion of identity and purpose between the HEIs and their public sector clients.
- Throughout the UK public sector , the approaches adopted to project and programme evaluation are predominantly founded on the methods and concepts discussed in HM Treasury's 'Green Book'. (HM Treasury: Green Book, Appraisal and evaluation in central government 2003) . The Green Book outlines the broad policy cycle ROAMEF .



Source Green Book HM Treasury: Green Book, Appraisal and evaluation in central government 2003

- It is clear from the ROAMEF diagram that the perspective adopted is that of demand-side government. The government is seen as a proactive customer, identifying projects it wishes to have undertaken for policy reasons and seeking to have these projects implemented to produce deliverables consonant with the resources expended.
- The supply side is essentially invisible in this diagram and is effectively assumed to be passive; that is, the supplier is a tool hired to satisfy the requirements of the particular government programme, no more, no less. For the purpose of delivering on the 'knowledge transfer agenda, from the government perspective Higher Education Institutions are basically one type of supplier and everything an HEI actually does is subsumed in the single ROAMEF box ' Implementation.'"
- This paradigm dominates UK public sector thinking to the extent that HEIs are translated into tools by which and through which government can effect policy changes and the outcomes it wishes . From a government perspective this may be perfectly reasonable. However the problem arises because HEIs have themselves tended to adopt much of green book thinking and phraseology, not least because the major funding agencies such as the Funding Councils and the Research Councils (which are acting on behalf of government) speak in green book terms. This is particularly important when it comes to differentiating between inputs, activities, outputs and outcomes.



Source: adapted from choosing the right FABRIC (A Framework for Performance Information)

- From a government perspective the most important elements of the above diagram are the **outcomes**. The current UK Research councils for example wish to be able to measure the outcome economic and social benefits , whether short-term or long-term, that result from the delivery of the research projects and programmes they fund. However the direct translation of the research council outcome objective of achieving economic impact cannot be simply passed on to the holders of research awards whose primary objective is on output i.e the successful completion of a specific piece of research. Higher Education applicants to Research Councils are now being asked to indicate the outcome economic benefits that could accrue as a result of their research.
- Drawing this distinction between outputs and outcomes is not always easy but it is in fact essential. The UN System of National Accounts (SNA) 1993. (which is also incorporated in ESA (95) and in the UK national accounting system) definition of output is as follows:
 "...output is a concept that applies to a producer unit – an establishment or enterprise – rather than a process of production. Output has to be defined in the context of a production account and production accounts are compiled for establishments or enterprises , and not for processes of production, Output therefore consists only of those goods or services that are produced within an establishment that become available for use outside that establishment."

And on Outputs vs outcomes

- " The output of health services needs to be clearly distinguished from the health of the community. Indeed one reason for trying to measure the output of health services may be to see the effect of an increase in the volume of health services on the health of the community, This obviously requires a measure of the volume if health services which is different from health itself... It is well-known that there are many other factors ...whose collective impact on the health of the community may be far greater than that of the provision of health services. "